

WHAT IS CLAIMED IS:

1. An alignment sensor, comprises:
  - means for generating interferometric first and second images of a symmetrical alignment mark having a center, the first and second images being rotated with respect to each other;
  - a first means for detecting the first image from the means for generating; and
  - a second means for detecting the second image from the means for generating;
  - means for analyzing output signals from the first and second means for detecting to determine a location of the center of the alignment mark.
2. The alignment sensor of claim 1, further comprising:
  - an illumination source having at least three different wavelengths, said illumination source providing coherent illumination to the alignment mark.
3. The alignment sensor of claim 1, further comprising:
  - an illumination source providing spatially coherent collimated electromagnetic radiation with a wavefront perpendicular to the alignment axis of the alignment sensor to the alignment mark.
4. The alignment sensor of claim 1, wherein:
  - said image rotation interferometer comprises glass prisms.

5. The alignment sensor of claim 4, wherein:  
the glass prisms comprises two prisms joined at a beamsplitter surface.
6. The alignment sensor of claim 1, wherein:  
said image rotation interferometer provides amplitude interference.
7. The alignment sensor of claim 1, wherein:  
said image rotation interferometer provides polarization state interference.